Applicant(s) : C. Reuben Walker

Serial No. :

Filing Date :

Art Unit : 1654

Examiner : Roy Teller

Title : METHOD AND APPARATUS FOR REDUCING THE CALCIUM AND PHOSPHOROUS RATIO AND INCREASING CRUDE PROTEIN IN SHELLFISH WASTE MEAL

AFFIDAVIT UNDER 37 CFR 1.131 OF RAO M. UPPU, PhD.

I, Rao M. Uppu, Ph.D. on oath do state the following:

I reside in Prairieville, La and currently employed as an Associate Professor of Environmental Toxicology at Southern University, Baton Rouge Campus. I have worked with and been involved in chemistry/biochemistry research for over 25 years. I have a Ph.D. degree in Biochemistry from Osmania University (1988), an M.S. degree in the area of Biochemistry from Andhra University (1977) and a B.S. degree in Chemistry from Hindu College (1975). I have been employed as an examiner in the U.S. Patent & Trademark Office (2000-2001). Prior to that I was a Research Assistant Professor at Louisiana State University, Baton Rouge Campus (1999-2000).

A review of the reference Peniston et al US 4,199,496 in light of the application 09/ 927,996 as submitted by C. Reuben Walker, I have concluded the following:

A. In examples I-V of the Peniston et al reference, Peniston uses either a base or caustic as the primary chemical and the first chemical treatment in the process, in these examples Peniston uses acid to neutralize the base in a subsequent step(s).
B. In example VI, Peniston et al uses a very high concentration of acid (hydrochloric acid; 5% by weight) initially but in combination with very high concentration brine (calcium chloride; 20% by weight). It is puzzling as to why Peniston et al

adds calcium chloride at such a high concentration, if that is the material he was trying to extract. This materially differs from the process as developed and claimed by Walker in application 09/927,996. In col. 18 lines 6-33 Peniston et al describes the use of acid but this was for the purpose of neutralization, which followed treatment with alkali (0.5-1% potassium hydroxide). This again is materially different from the acid treatment Walker developed and claimed in the application 09/927,996.

C. Peniston et al uses a wide range of chemical treatments (alkali, brine, and acid) and physical processes (several centrification steps) which are time consuming and increases the manufacturing costs so the final product does not have any monetary benefit. Perhaps, this could be the reason why no product was on the market using this process.

D. The process as disclosed and claimed by Walker 09/927,996 uses hydrochloric acid as the first and final chemical treatment. This is less time consuming and cost effective, and thus provides a greater opportunity for a more economically feasible livestock feed.

E. Throughout the Peniston et al reference the effluent and discharges are extremely caustic and involve transportation of the treated materials from one location to the other which pose health hazard in addition to significantly increasing the cost of manufacturing.

In conclusion, Peniston et al and Walker teach significantly different processes. Peniston et al discloses an akali or caustic extraction process, while Walker 09/927,996 teaches an acid-based treatment process. Peniston et al focus on the extraction of chemicals versus that of Walker who's focus is on livestock feed. Peniston's process is more complicated and involves multiple applications of chemicals, which has a risk of introducing unwanted trace chemicals into the food chain.

Affiant further saith naught.

Rao M. Uppu

Affiant

County of East Baton Rouge)

State of Louisiana)

Sworn before me this 5 of December 2003.

Norma Edelman, #8898

Notary Public

Applicant(s) : C. Reuben Walker

Serial No. :

Filing Date :

Art Unit : 1654

Examiner : Roy Teller

Title : METHOD AND APPARATUS FOR REDUCING THE CALCIUM AND PHOSPHOROUS RATIO AND INCREASING CRUDE PROTEIN IN SHELLFISH WASTE MEAL

AFFIDAVIT UNDER 37 CFR 1.131 OF C. REUBEN WALKER, PhD

I, C. Reuben Walker, Ph.D. on oath do state the following:

I reside in Lafayette, Louisiana and currently employed as the Program Leader of Animal Science at Southern University, Baton Rouge Campus. I have worked with and been involved in Animal Science research for over 18 years and serves as the lead shellfish waste researcher for Southern University Agricultural Research and Extension Center for the past 12 years. I have a Ph.D. degree in Animal Breeding and Genetics from Oregon State University (1983), a M.S. degree in the area of Animal Breeding from Oregon State University (1980) and a B.S. degree in Animal Science from Louisiana Tech (1976).

A review of the reference Peniston et al US 4,199,496 in light of the application 09/ 927,996, I have concluded the following:

Louisiana produces over 90% of the shellfish harvested in the nation. The shellfish harvested consists of crawfish, shrimp, and crabs. At the present time, in Louisiana there are approximately 30 processing plants for shellfish. As a result approximately 60 million pounds of shellfish waste is produced annually. Therefore, the conversion of even a small portion of this waste into a viable product will result in less of a burden environmentally and a value added product from shellfish. This should provide an economic impact to the shellfish industry where the cost profit lines are critical.

A. Currently, soybean meal is the livestock industry standard protein feed. The feed is feed to hogs, poultry, and cattle. Soybean averages 44% crude protein, with .67 percent by weight for phosphorous, and .38 by weight for calcium. A feed with high protein and low levels of calcium and phosphorous are desired for feeding livestock. Soybean meal has these attributes. However, shellfish waste processed by the method in this application are similar to soybean meal as shown in Table 2 of the application. Processed shellfish waste averages 61% crude protein and less than 1% for both calcium and phosphorous.

B. The biggest cost in farm animal production is feed. The largest cost in feed is protein. Soybean meal is the primary protein feed. The major consideration is cost for the livestock producer. Bagged soybean meal in fifty-pound bags averages $480 per ton. Fish meal averages over $760 per ton. In the event processed shellfish waste is produced and sold for $480 or less, because of its higher protein levels it could become the standard in livestock feed.

C. The process as disclosed in application 09/927,996 is field ready and easily adaptable. The process only uses one chemical (hydrochloric acid) and is water-soluble. The process is less time consuming and cost effective, and thus provides a greater opportunity for a more economically feasible livestock feed. The method as disclosed in Peniston et al uses a myriad of chemicals, and an extensive and complicated process that environmentally has a risk potential for accidents.

D. The process as disclosed and claimed by Walker 09/927,996 differs significantly from that in Peniston et al. The step of stirring and settling allows for a more complete chemical reaction and is a requisite step in the process in the Walker 09/927,996 application.

E. Currently, shellfish waste at the plants is refrigerated until delivered to landfills. In the alternative, shellfish waste is illegally dumped in the waterways, rivers, and bayous thus creating an environmental hazard. The process as disclosed will help relive this environmental burden shellfish waste presents the coastal economy.

In conclusion, the process as disclosed in Peniston et al, is not on the market. In 18 years of research, I have not seen nor heard of any shellfish based livestock feed having the levels of protein and low calcium and phosphorous levels as taught by the Walker process. The process as disclosed in Walker 09/927,996 converts a previously environmentally damaging product to a viable economic commercial product. The resulting product can only lead to increased employment and economic stability for coastal fisheries.

Affiant further saith naught.

C. Reuben Walker

Affiant

Parish
~~County~~ of East Baton Rouge

)

State of Louisiana

Sworn before me this 12th of December 2003.

Harold W. Isadore

Notary Public

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Applicant(s) : C. Reuben Walker

Serial No. :

Filing Date :

Art Unit : 1654

Examiner : Roy Teller

Title : **METHOD AND APPARATUS FOR REDUCING THE CALCIUM AND PHOSPHOROUS RATIO AND INCREASING CRUDE PROTEIN IN SHELLFISH WASTE MEAL**

AFFIDAVIT UNDER 37 CFR 1.131 OF MARY COURTNEY

I, Mary Courtney under oath do state that:

I reside of East Baton Rouge, La and currently employed as an Instructor/Laboratory Assist-Technician for Southern University, Baton Rouge Campus. I have worked in the chemistry department for over 26 years. I have a M.S. degree in chemistry from Southern University (1987), and a B.S. degree in the area of Organic and Analytical Chemistry from Southern University (1977).

A review of the reference Peniston et al US 4,199,496 in light of the application 09/927,996 as submitted by C. Reuben Walker, I have concluded the following:

A. In examples I-V of the Peniston et al reference, Peniston uses either a base or caustic as the primary chemical in the process.
B. In example VI Peniston et al uses the acid initially to neutralize the pH, however he then uses a base potassium hydroxide to extract chitin but in addition he applies heat to the mixture in an attempt create a stronger reaction.
C. Peniston et al discloses and claims the use of sulfuric acid as a means to reduce the pH. The FDA and USDA both state that that this chemical it is unacceptable for consumption by humans and livestock.

D. A clear difference between Peniston et al and the application of Walker is that the patent's focus is the extraction of the chemicals while the focus of Walker 09/927,996 is to produce an acceptable livestock feed.

E. In connection with C above according to Peniston's claims in example VI, calcium chloride is liberated in the process which is in line with his claims for liberating chemicals from the Shellfish. Liberating the chemicals is good, however, depending on the final end-user of the product further refining and/or purifying will need to be done on these chemicals in order to bring them up to standards for chemicals (International Union of Pure and Applied Chemistry or IUPAC and/or American Chemical Society or ACS standards for chemicals. Thus, for a recovery of the chemicals to occur Peniston et al shall have to further refine create either a caustic or alkaline effluent.

F. The process as described in application 09/927,996 of Walker uses an acidic based process. The primary chemical being HCL. HCL is the major digestive juice present in the human digestive tract. With a recovery pH of between 6.5 and 7.0, the livestock ingesting these pH levels are well within those recommended by the USDA and the resulting effluent is within EPA guidelines.

G. The process as claimed by Walker is more environmentally friendly. The resulting effluent is neutral. The acid HCL is less costly then the chemicals used by Peniston et al. and no additional energy is required to create the end product.

In conclusion, the process as described by Peniston et al. discloses an alkaline based process for the extraction of chemical from the shells of shellfish. The process as disclosed by Walker in 09/927,996 is an acid based process using the whole shellfish waste and which increases the protein levels while decreasing the phosphorous and calcium levels. The process as claimed by Walker is a least costly and more environmentally friendly process to create a viable product from a previously useless waste product.

Affiant further saith naught.

Mary Courtney
Affiant

Parish ~~County~~ of East Baton Rouge
)
State of Louisiana)

Sworn before me this 15th of December 2003.

Harold W. Sadler
Notary Public